



## Case Report

# Case report of a guide wire loss and migration after central venous access<sup>☆</sup>



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**Abstract** We report a case of guide wire loss and migration after central venous access for spinal deformity surgery. Guide wire migration was noticed on a follow-up full spine x-ray 69 days postoperatively. Percutaneous retrieval was successfully performed using endovascular techniques. With this case report, we want to highlight the fact that one could miss other pathologies visible on these full spine x-rays when concentrating only on the measurement of spinopelvic parameters.

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## 1. Case

A 53-year-old woman presented with a flat back deformity after multilevel spinal fusion and underwent a revision spinal decompression and posterior fusion from T11 to the sacrum. A Smith Petersen osteotomy and transforaminal lumbar interbody fusion were performed at the level L1-L2 as well as a pedicle subtraction osteotomy at the level L3 to correct the sagittal imbalance.

After induction, a central venous catheter was placed via the right internal jugular vein by a resident in anesthesiology in the setting of a major training center, University Hospitals Leuven. The surgical procedure

was uneventful. A postoperative chest x-ray was performed. A correct position of the catheter was confirmed, and pneumothorax was absent (Fig. 1).

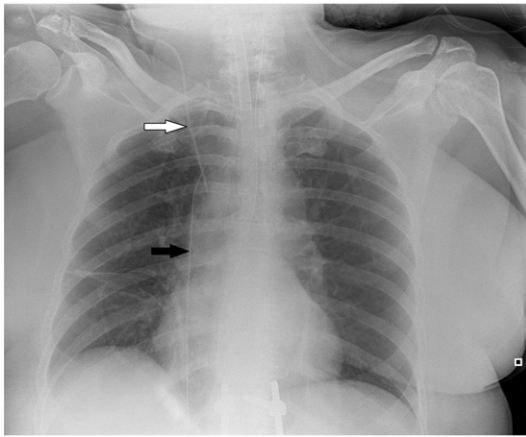
A few days postoperatively, the patient had a full spine x-ray of moderate quality. Positioning of spinal instrumentation and spinal deformity correction are classified as satisfactory. No abnormality was reported by the surgeon nor the radiologist (Fig. 2). The postoperative course was uneventful, and the patient was discharged at day 7. Nine weeks postoperative, the patient presents at the orthopedic outdoors clinic for first checkup. She is very satisfied with the improvement of her low back pain and only takes paracetamol.

Full spine x-ray shows a correct position of the spinal instrumentation and a corrected sagittal balance posterior spinopelvic harmony. However, on the anteroposterior view, the surgeon marks a complete guide wire, lost from the central catheterization and migrated to the right lower extremity with one tip in the superior vena cava and the other end halfway the thigh (Figs. 3 and 4). Further x-rays of the right femur and right knee confirmed the presence of

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**Fig. 1** Chest x-ray after central venous catheterization with the catheter placed in the superior vena cava (white arrow) and the guide wire that is still in place (black arrow).

this guide wire. After informed consent, the intravascular foreign body was percutaneously removed via lasso technique (Amplatz goose neck; EV3, Plymouth, MN) under local anesthesia by our interventional radiologist (Fig. 5). The procedure was uneventful, and the patient is still doing fine (Fig. 6).

## 2. Discussion

Thorough examination of all postoperative x-rays is vital not only to assess the surgical repair (evaluation spinal deformity, measurement of spinopelvic parameters, spinal deformity correction, and position of instrumentation) but also to rule out complications. In this case, both surgeon, anesthesiologist (resident and supervisor), and radiologist did not remark the guide wire at the initial x-rays. Often, the origin of this type of error can be situated in the psychologic field rather than in the field of medicine. Missing the guide wire on x-ray can be beyond an individual's conscious control due to a lack of attention or attention only on a specific focus as mentioned above [1].

Percutaneously catheterization of central veins is a routine procedure but has complications and pitfalls [2,3]. Guide wire loss is one of them and can cause thrombosis, embolism, perforation, cardiac arrhythmias, and sepsis [4]. In most cases, broken guide wires and fragments are found. Loss of a complete guide wire as we report is uncommon [4]. Some predisposing factors and signs of guide wire loss are described in the literature [5]. The wire should always be held at the tip to prevent passage into a vessel [5]. Safety measurements with a standard protocol including time out and sign out checklists as mentioned by the World Health Organization and also



**Fig. 2** First postoperative full spine x-ray of moderate quality. The guide wire is visible but was initially not remarked.

direct supervised bedside teaching [6] are mandatory to prevent this type of complication. Bedside teaching means automatically that there are minimum 2 clinicians (resident and supervisor) who can help each other not to forget a wire and communicate about the different steps during the procedure to stay alert. They can both check the postoperative chest x-ray. Finally, counting the equipment after the procedure as also stated in World Health Organization sign out guidelines can be of crucial importance to prevent errors. In this case, probably a combination of factors made that the wire was unnoticed

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